Ref; ITI/ROHYD /MKTG /10/2010/ 13Dt. 29.10.2010

Expression of Intrest For

EXPANSION OF DATACOM NETWORK (Phase -4) for VSP

ITI LIMITED a Central Government PSU under Ministry of communications and IT invites "EOI for identifying the business partner for Supply of **EXPANSION OF DATACOM NETWORK (Phase -4) for VSP**

The OEM/ authorized Dealers must have the Minimum following qualifications/experience

- Minimum turnover Rs 1 Cr for the last three financial Years. i.e. 2007-08, 2008-09 and 2009-10.
- The company must be in the similar field at least for the last three years.
- The company must have done the at least one similar work with government agency / any PSU.
- **Technical Specifications are as enclosed (Technical compliance to be enclosed in technical bid Line by Line / point wise .)**

The responses should have the following details

Bidders Profile

1.	Name of the Organization:	
2.	Complete Address:	
3.	Date of Incorporation in India(copy to be enclosed)	
4.	Contact Person:	
	Name Designation Telephone/ Fax E-mail	
5.	Sales tax no.(Please enclose the certificate copy AP VAT &CST)	
6.	PAN No with IT Returns : (Please enclose the certificate copy)	
7.	Service Tax Registration.(Please enclose the certificate copy)	
8.	Article of Association Submitted or Not	
9.	ISO or Equivalent Certification to be enclosed	
10.	Number of Regular IT Professionals working with the Organization	

11.	Annual Turnover from total IT solutions for last three years(Enclose the audited copy of the Annual report)	Year	Turnover in Crores of Rs.
		2007-08	
		2008-09	
		2009-10	
12.	Executed at least one similar project in the last three years	Yes/No	
	If yes please furnish complete project details with completion certificates		
13.	Organization blacklisted	Yes/No	
14.	Willingness to work with ITI on back-to-back basis as per tender terms and conditions including arranging Bid Security, Performance Bank guarantee etc. and implementing the project in the event of ITI, winning the contract. (as per GCC&SCC of VSP)	Yes/No	
15.	Litigation on similar services	Yes/No	
16.	Financial Bid: **The lowest offer should be enclosed in separate cover**		
17.	Registration certificates of PF & ESI if any to be enclosed .		

All pages should be signed and stamped by authorized signatory of the bidder(Proof of authorized signatory/power of attorney should be enclosed)

Selection of business partner against this EOI is solely under the discretion of this office

The EOI may be sent **on or before 15.00 Hrs of 10.11.2010** in a sealed cover marked "**EOI for Ref; ITI/ROHYD /MKTG /10/2010/ T13 Dt.29.10.2010**

" and addressed to

CHIEF REGIONAL MANAGER
Regional Office-Hyderabad
3-6-365 /A, 3rd FLOOR,
Himayath Nagar
Phone: 40-23262535,23262575 Fax: 040-23262545
Email: ro_hyd@itiltd.co.in
website: www.itiltd-india.com

13. SCOPE OF WORK BY SUCCESSFUL TENDERER:

13.1. The scope of work includes supply of all materials at site, including equipment, cables, facilities and spares, erection, preparation of as-built drawings and documents, testing and commissioning of the OFC Datacom network (phase-4) and associated equipments as per the bill of quantities. The design is based on Cat.6 components and SMF cables only. Tenderer has to ensure that all the supplied materials are conforming to the same.

13.2. The scope of supply shall include, but not be limited to the items listed below:

13.2.1. Layer 2 managed switches in 42U/12U rack with (a) 4 port, 10/100 base-T & one SFP port (b) 8 port 10/100 base-T auto-negotiating RJ-45 ports & one SFP port, (C) 24 port 10/100/1000 base-T RJ 45 ports & two nos. of SFP (GBIC/mini GBIC) ports with loaded transceivers (for SMF only) and other related accessories.

13.2.2. 24 port SC fibre patch panels (SM type) with loaded SC duplex couplers and related accessories like label holders, mounting hardware etc.

13.2.3. 24 port Cat.6 UTP patch panels with loaded RJ 45 jacks and related accessories.

13.2.4. Cat.6 RJ 45 wall outlets with modular jack, face plate, spring loaded shutter, deep back mount box, label holder and related hardware.

13.2.5. 1.5 to 2 mtr. length SMF pig-tails for splicing the incoming and outgoing fibre cables into the fibre patch panel.

13.2.6. OFC splice enclosure as per specification for splicing the armoured OFC cables.

13.2.7. 9/125 microns SMF and Cat.6 UTP patch cords as per specification.

13.2.8. 9/125 microns outdoor type SMF armoured cables including laying in new trenches or existing trenches as per specification.

13.2.9. Cat.6 UTP cable including laying in 25 mm dia. PVC/GI conduit as per specification.

13.2.10. Network tools as per specification.

13.2.11. All power wiring including conduit from the 230 V AC power source is included in tenderer's scope of work, which is at a maximum of 20-30 mtrs. from the switch rack.

13.2.12. Any other equipment, device, component not specifically included but required for ensuring the functional capabilities specified for the OFC network.

13.3. Training package consisting of:

13.3.1. Two days training for four persons on network tools (Network cable analyzer, network multimeter, visual fault locator, etc.,) fundamentals, operation, trouble shooting, configuration, do's and don'ts at OEM's or his

authorized trainers' place or at VSP onsite.
13.3.2. Two days structured Training on all the items being supplied in the tender (LAN Networking) at VSP premises along with course material for 20 persons (on both active and passive components).

14. ERECTION,TESTING & COMMISSIONING:

14.1. The tenderer shall provide all skilled, semi-skilled and unskilled workers including supervisory staff, tools and tackles, consumable materials, erection & testing equipment and instruments and all other related equipment required for the complete erection, integration with existing OFC network in VSP plant areas and testing of the complete OFC back-bone and associated equipment including smooth change-over for upgradable switches at the existing locations to the new locations, without effecting the communication links in the shops / areas concerned.
14.2. The work at site shall include but not be limited to the following:
14.2.1. Receipt at site of all equipment and materials covered under this contract at VSP site, drawing of the same after goods inspection and acceptance, when these are sent by the manufacturers and sub-suppliers and transporting of all materials to site.
14.2.2. Opening of crates and packing cases, thorough cleaning and checking of completeness of equipment etc., in relation to equipment manufacturers drawings, packing list etc. and inspect the equipment etc for any visible damage or defect. Damage or missing items, if any, shall be rectified by or made good by the contractor.
14.2.3. Providing storage and safe custody of the equipment etc. at site for which a specified space will be allocated to the successful tenderer , till such time they are erected ,tested and commissioned and handed over to the purchaser. Any damage to the equipment etc. during this period shall be made good by the contractor at his own cost.
14.2.4. Installation of all switches, switch racks, laying and termination (splicing) of all cables, tagging/ferruling and commissioning of the same.
14.2.5. Entire LAN shall be tested for class E performance with level III testers like Fluke DSP 4300 with reference to standards AS/NZS 3080:2004. Standard parameters like Impedance, attenuation, length, return loss, NEXT, PSNEXT, ACR, delay skew, etc., are to be tested as part of Preliminary Acceptance testing.
14.2.6. Painting of all site fabricated items and fittings.

15. WORK BY OTHERS :

15.1. Following work will be executed by the purchaser through "others" and are excluded from the scope of work of the tenderer.
15.2. Lighting, air-conditioning and ventilation facilities as required for the switches and associated equipments.
15.3. 230 volts AC, single phase, 50Hz electric power supply switch board with switches and sockets near to the switch rack locations.

16. TECHNICAL SPECIFICATIONS:

16.1. GENERAL:
16.2. Shall submit authorization support letters for the offered makes from OEM/s for switches, passive components and network tools with reference to this

tender.
16.3. The makes of active and passive components shall be of enterprise grade.
16.4. The entire range of passive components shall be of the same make (to enable OEM certification of the cable plant).
16.5. The makes and models/brands offered for network switches, passive components, racks shall be of OEM's who possess ISO /NQA (National quality assurance) certification.
16.6. The active components must be UL listed/certified, passive components certified by UL/ETL/Pyramid/equivalent. Proof to be submitted.
16.7. The project envisages extension of the Plant's OFC based Gigabit Ethernet to various offices and other buildings in VSP.
16.8. The tenderer shall ensure that the new OFC backbone network of this project is seamlessly interfaced with the existing Gigabit Ethernet LAN of VSP. All materials required for this from VSP end including Network Interfaces, shall be indicated by the tenderer in his technical offer.
16.9. The SMF Cable shall serve both Data and Telecommunication needs in the plant.
16.10. The materials and installations shall conform to relevant Gigabit Ethernet LAN standards conforming to Cat. 6 and TIA/EIA 568A/B, 2-1, ISO/IEC 11801, EN 50173, AS/NZS 3080: 2004 standards or later. Shall support class E applications, ISO/IEC 8802.3 standards.
16.11. Locations of Network Switches, switch racks in the project will be indicated at the time of installation by engineer-in-charge.
16.12. No UTP link from network switches to wall outlet shall exceed 100 mtr. including patch cords at both ends. The switches are to be suitably located for ensuring the same.
16.13. All the materials listed in the Billing schedule are to be supplied to VSP site. Inspection will be carried out at VSP site and Inspection Certificate will be released after inspection. The tenderer shall take out the materials to the required sites for installation after submitting an Indemnity bond as per VSP proforma. This Indemnity bond shall be valid till the date of Final acceptance by VSP.
16.14. The material inspections and the network installations shall be executed through Telecom/ IT departments of VSP.
16.15. The tenderer shall identify the makes and models of all the materials to be supplied in this order and also submit detailed technical brochures. Prior clearance from VSP is to be obtained for all the items to be supplied before making any bulk supplies. Samples are to be submitted, wherever required.
16.16. Power supply connection shall be drawn by a suitable 3 core x 1.5 sq mm copper cable (of BIS approved make) from the existing nearby identified power distribution board. All materials required for tapping the power supply including supply and laying of cables in conduits as per site are in the scope of the tenderer.
16.17. The scope of work involves configuration of the network at the switches end and also at the PC's end. Each node on the network shall be demonstrated for connectivity with the existing PC. Wherever PC is not available, the network connectivity shall be demonstrated using tenderer's lap-top.
16.18. The scope shall include supply and installation of all accessories and materials including clamping arrangements, sundry civil materials, carpentry

works etc (other than the one listed in the BOQ), required for completion of the project.

16.19. All equipments/ cables / cores / patch cords / patch panels etc are to be properly labeled and provided suitable identification as per structured cabling standards. In the cable trench where SMF cable are laid, cable tags are to be provided at 50 m intervals, both ends of road crossing pipes, at junctions and at terminations.

16.20. The tenderer shall make estimates for fiber cable lengths at site so as to ensure that no joints/ splices are involved in the distribution cables (i.e. to all workgroup switches) and make the supply of fiber cable in required single lengths. For the long runs, fusion-spliced jointing is allowed at reasonable distances, for which prior clearance of VSP is to be obtained.

16.21. The tenderer shall deploy adequate number of technical persons during execution of the work and also for testing activities.

16.22. Entire LAN shall be tested for class E performance with level III testers like Fluke DSP 4300 with reference to standards AS/NZS 3080:2004 or later. Standard parameters like Impedance, attenuation, length, return loss, NEXT, PSNEXT, ACR, delay skew etc are to be tested as part of Preliminary Acceptance testing and accepted test reports to be submitted in two sets (one hard and one soft copy).

16.23. ITEM-WISE TECHNICAL SPECIFICATIONS :

Twelve core and six core single mode, outdoor, Multi-Loose Tube, Armoured, Direct Burial Optical Fiber Cable:

- Shall be as per TIA / EIA 568 B.3 and ISO 11801, ITU-T: G-652.D, IEC: 11801 & 60793.
- Shall be of single-mode, armoured, multi-tube construction, gel-filled variety.
- Shall have core of 9 µm, cladding of 125 µm and coating of 245 µm size (diameter).
- Shall have 12 cores or 6 cores as specified, with distinguishing colour code as per TIA 568A, IEEE 802.3 standards or above.
- Shall have a maximum attenuation of 0.38 db/km at 1310 nm and 0.25 db/Km at 1550 nm.
- Shall be suitable for operations on 1310/1550 nm wavelengths.
- Shall be supporting bandwidth in excess of 500 MHz/km.
- Shall be supplied in suitable single lengths as per route distances to avoid splicing / jointing in between.
- Shall be suitable for direct burial in ground.
- Shall be multi-loose tube construction with twelve or six strain free fibers(as per boq) in high moulded plastic loose tube , dummy fillers, water blocking gel, metallic/non-metallic glass or fibre reinforced plastic central strength member, rip cord, plastic / water swellable tape wrapped, HDPE inner sheath, polymer coated corrugated steel armour, UV and rodent resistant HDPE outer sheath/jacket.
- Shall be laid in trenches with 100 mm sand cushioning and with protective RCC slab covers as specified.
- Shall be laid in cable trays / pipes / tunnels / along structures as required. Necessary clamps and accessories are to supplied and installed.

- Shall be provided with cable tags / identifiers at the terminated ends.

Six/twelve Core Single Mode Outdoor Corrugated Steel Tape Armoured Cable shall meet the following physical and optical parameters:

ITEMS	UNITS	SPECIFICATION	Party Offered parameter	Complied (Yes/No)	Remarks
Attenuation	dB/km	≤ 0.38 at 1310nm ≤ 0.25 at 1550nm			
Chromatic Dispersion	Ps/nm.km	≤ 3.5 at 1285nm ~ 1340nm ≤ 18 at 1550nm			
Zero Dispersion Wavelength	nm	1302 ~ 1324			
Zero Dispersion Slope	$Ps/nm^2.km$	≤ 0.093			
Cut-off Wavelength(λ_c)	nm	$1150 \leq \lambda_c \leq 1330$nm			
Mode Field Diameter	μm	9.3 ± 0.4 at 1310nm			
Mode Field Concentricity	μm	≤ 0.8			
Cladding Diameter	μm	125 ± 1.0			
Cladding Non-circularity	%	≤1.0			
Coating Diameter	μm	245 ± 10			
Proof Test	Kpsi	≥ 100			

CABLE CONSTRUCTION: The construction of the cable shall be in accordance with Table below.

ITEMS	DESCRIPTION	Party Offered parameter	Complied (Yes/No)	Remarks
Number of Fibers	6/12			
Type of Fiber	Single Mode			
No. of Fibers per Tube	Max. 12			
Loose Buffer Tube	Material PBT (Polybutylene Terephthalate) Diameter Nom. 2.4 mm			
Filling Compound in Loose Buffer Tube	**Thixotropic Jelly Compound.**			
Filling Compound between Loose Buffer Tubes	**Polybuthane Type Jelly Compound.**			
Central Strength Member	FRP (Fiber glass Reinforced Plastic)			
Core Wrapping Tape	Plastic Tape (To provide heat barrier and good forming of core)			
Dielectric Strength Member Water Blocking Material Armour	Glass yarn (To provide the required tensile strength together with the central strength member) Water Swellable Tape. (To prevent the ingress of water) Steel Tape Armouring.			
Outer Jacket				
Material	Black MDPE /HDPE			
Thickness	Min.1.25mm, Nom. 1.8mm			

FIBER AND LOOSE BUFFER TUBE IDENTIFICATION: The color code of the loose buffer tubes and the individual fibers within each loose buffer tube shall be in accordance with table below:

The Color Code of the Individual Fibers and Loose Tubes

No. of Fibers/ Loose Buffer Tubes	Color	No. of Fibers/ Loose Buffer Tubes	Color
1	Blue	7	Red
2	Orange	8	Black
3	Green	9	Yellow
4	Brown	10	Violet

5	Gray	11	Pink
6	White	12	Aqua

Cat.6 UTP Cable:

- Shall be of Cat. 6 standard conforming to TIA/EIA-568-B.2-1, ISO/IEC 11801, EN 50173 , AS/NZS 3080: 2004 standards. Shall support class E application, 1000 base-T Ethernet port, 1000Mb/s data rate, 250 Mhz bandwidth and ISO/IEC 8802.3 standards.
- 23/24 AWG, solid bare oxygen free copper, polyolefin/PE insulated, Pair separator/central spine, ripcord, PE filler and overall sheathed.
- Shall be stamped with running length at every meter.
- Shall be supplied in standard reel lengths of 305m.
- Shall be laid in GI conduits or in PVC pipes / PVC Casing & capping as per requirement.
- Maximum attenuation of 32.8 db/ 100m at 250 MHz.
- Return loss better than 17.3 db at 250 MHz.
- Shall have no joints between network Switch rack to Wall outlet.

4 port network switch:

- Shall be a L2 premise-managed Ethernet switch.
- Shall be with minimum 4 Tx ports and one SFP slot suitable for 100base FX and LX; Both type of transceivers are to be supplied (one no. Each)
- Shall support 10BASE-T Ethernet,100 BASE-TX/FX Ethernet, IEEE 802.1d Spanning tree protocol, IEEE 802.1Q VLAN tagging,1Gbps backplane speed, IGMP Snooping v1/v2, Traffic Management and QoS, Configuration by telnet/web etc.,
- Shall be suitable for operation on 200-240V AC of 50Hz. Suitable power cord of Indian design is to be supplied.
- Manufacturer's letter to be submitted with serial no. reference for warranty terms.
- The OEM shall be having ISO certification for manufacturing of switches.
- Shall be configured at site based on data provided by VSP as per site requirement
- Shall have relevant safety and EMC certifications

Fiber patch panel:

- Shall be made of standard metal construction/poly carbonate or ABS, powder coated and suitable for mounting in a standard 19" switch rack.
- Shall have provision for entry of 4 nos. of armoured fiber cables, fiber reeling spool and suitable arrangement of dressing & physical protection of fiber cores.
- Shall have management rings within the system to accommodate excess fibre cordage behind the fibre reeling spools and maintain min. bending radius.
- Shall have built-in label facility, an open-able/sliding top cover, mounting aid, adapter rails and other mounting hardware, etc.
- Shall be suitable for terminating 24 number of fiber cores (with pigtail arrangements for SC connectors as required) and all the slots are to be loaded with individually detachable SM-SC simplex couplers with zirconia

ceramic sleeve and to accommodate SC connectors of pigtails/patch cords.
- Shall be of 1U height for 24 ports.
- Shall have a fiber splice tray for accommodating incoming fusion spliced fiber cores, 24 nos. protection sleeves & for ensuring minimum bending radius.
- Shall have front and rear port labeling, OFC/patch cord identification tags as well as panel identification labels.
- For Single mode SC adaptors the maximum insertion loss should not be greater than 0.15 dB and mating durability shall be not less than 1000.

Cat.6 UTP Patch Panel:

- Shall comply with ISO 11801, class E, TIA /EIA 568 – B .2-1, FCC 68.5, 1000 Mbps standards.
- Shall be made of standard powder coated, metal construction and suitable for mounting in a standard 19" rack.
- Shall have a cable manager for the UTP cables along with mounting aid, rings, railings, mounting hardware, etc.
- Shall be housing RJ 45 jacks with dual colour coding allowing for 568A/B wiring configuration and suitable for termination of 4 pair Cat.6 UTP cables.
- Shall be having 24 nos. of Cat.6 type RJ 45 jacks and shall have preferably spring loaded / flip shuttered type closing mechanism for preventing dust ingress.
- The RJ 45 jacks' termination shall be as per KATT-IDC, Krone, AT&T, 110 type IDC silver coated terminal blocks. (TIA/EIA 568 A or B standards)
- The RJ 45 connectors shall be of poly carbonate housing, contact material of copper alloy and contact plating of 50 microns gold/100 microns nickel.
- The RJ 45 jacks / connectors shall have capability to accommodate wire diameters from 22-24 AWG.
- Shall have front and rear port labeling, UTP cables/patch cord identification tags, panel identification labels.
- Shall be suitable for terminating 24 number of UTP cables.
- Shall be of 1U height for 24 port patch panel.

42U Switch Rack with accessories;

Shall be

- Of 42 U size, 1000 mm depth, 800 mm width and suitable for mounting standard 19" network equipments and shall confirm to DIN 41494 and IEC 297 standards.
- Including i. Cable manager: vertical 2 nos., horizontal-2 nos., ii. Horizontal trays – 1 no. iii. Ventilation fans – 4 nos. in a tray iv. Power supply distribution boards (two vertical type and two horizontal type) – 4 nos. (Each having at least 4 nos. of 5/15A, 230 V AC sockets & with mains On/OFF switch, power cord and indicator) v. stationary shelf- 1 no. vi. Hardware pack – 4 sets.
- Shall have a slotted angle frame suitable for mounting switches/patch panels at desired elevations within the rack.
- With a hinged doors on front & back and shall have a front transparent plated door fitted with toughened tinted glass/acrylic material. This is required to enable clear display of the front facia of the equipments

mounted inside the rack.
- Having a standard universal built-in lock which is common for all the supplied racks in the project.
- Having open-able cable entry plates at the top and bottom of the rack.
- Of floor mounting type (without wheels) and shall be mounted on a painted MS angular stand of 300mm height. The stand shall be grouted/placed on the floor.
- Include all accessories like nuts, bolts, fasteners etc required for installing the rack and its components.
- All incoming cables are to be neatly laid from the nearby wall to this rack on a cable tray (of 2 m approximate length on the rear side).This tray has to installed at an elevation of about 1 ft from the floor level.
- All entry holes shall be sealed with cable putty after cable termination works are completed.
- All cables and patch cords are to be neatly laid and dressed in the rack..
- Proper earthing of the rack is to be done using stranded GI wire and linking to an existing earth strip.
- Incomer to the power-supply board in the rack shall be drawn from a nearby power supply distribution board. For the existing Network chassis switch, dual power sources are to be linked.

<u>12U Switch Rack with accessories;</u>

- Shall be of single section type and shall support wall mounting installation suitable for mounting standard 19" network equipments.
- Shall confirm to DIN 41494 and IEC 297 standards and of specified height 12U and depth not less than 630mm.
- Shall be of suitable depth so as to have a clearance of at least 200mm (between back wall & switch) on the rear side of the rack after mounting the switch.
- Shall be made of 1.4 mm, powder coated MS sheet metal with suitable slots for ventilation.
- Shall be having metal enclosure on all sides including back side, except on the front side.
- Shall have a slotted angle frame suitable for mounting switches/patch panels at desired elevations within the rack.
- The front side shall be with a hinged door consisting of a transparent plate of suitable glass/acrylic material. This is required to enable clear display of the front facia of the equipments mounted inside the rack.
- The front door shall be open able side wards with locking eye provision.
- Each rack shall be having a standard built-in lock which is common for all the supplied racks with universal two keys for each rack in this project.
- Shall have a rack mountable 1 U / 2 U sized, power-supply board mounted at the top of the rack with 4 numbers of 5/15A combination sockets and individual switches suitable for connecting to network switches, laptops, test equipments etc. The power supply board shall have a mains control switch.
- Incomer to the power-supply board in the rack shall be drawn from a nearby power supply distribution board.
- Shall have suitable ventilation mounted in the rack to dissipate the heat

generated in the rack. The 12U racks shall have two-fans in a tray mounted on the top.

- All 12U racks shall be mounted at a height of about 1.8 m from the floor level. The racks shall be installed by grouting and fixing at least 4 nos. of anchor type bolts on the wall. The installation shall be rigid and suitable for the total load of equipments mounted in the rack.
- Shall have open-able entry plates at the top and bottom of the rack. These plates shall have knockouts suitable for cable /conduit entries.
- Shall have one no. of cable manager, one spare hardware pack and one stationary shelf with accessories.
- Shall include all accessories like nuts, bolts, fasteners etc., required for installing the rack and its components.
- All entry holes shall be sealed with cable putty after all cable termination works are completed.
- All cables and patch cords are to be neatly laid and dressed in the rack.
- Proper earthing of the rack is to be done. The earthing includes supply and installation of stranded GI wire connectivity to an existing nearby suitable earth flat/strip.
- Scope also includes dismantling and relocation of the existing switches/switch racks (2 or 3 nos.) as per instruction of Engineer-in-charge.

SMF Pigtail:

- Shall have factory crimped SC connectors with UPC polishing as required at one end of length 1.5 to 2 meters..
- The terminal attenuations shall not be more than 0.35 dB.
- The manufacturers' test results are to be furnished along with each pigtail.
- Shall be of standard and suitable length as required for fusion splicing with outgoing / incoming fiber cable cores.
- Shall have dust covers/ accessories required for fixing / installation in Fiber patch panels.
- Shall be of 9/125 µm single mode type, 0.9mm tight buffered, 3.0 mm cable as required.
- Shall have ferrule material of Zirconia ceramic, housing body of nickel plated Zinc and boot of thermoplastic elastomer.
- Minimum return loss should be greater than or equivalent to -45 dB in mating position.
- Shall be supplied and installed along with fusion splice protection sleeves.
- Shall have colour code as per TIA/EIA standards.
- Shall be fusion spliced with the incoming fiber cores.

8 port Network switch:

- Shall be having 8 nos. of 10/100 Mbps auto negotiating RJ 45 UTP ports.
- Shall be equipped with one no. of up-linking SFP slot suitable for 100base FX and 1000 base LX transceivers. Both type of transceivers are to be supplied (one no. Each)
- Transceivers shall support (GBIC/Mini-GBIC) 9/125 microns SMF and 62.5/125 micron MMF cables.

- One no. each (SMF & MMF) fiber patch cords of 3 mtr. length & suitable for up-linking port are to be supplied along with each switch.
- Shall be capable of layer 2 functionalities.
- Shall have switching fabric capability of 16 Gbps, packet throughput of 2.7 Mpps.
- Shall have status/diagnostic indicators for all ports.
- Shall have features like QoS with priority queues, web GUI, 802.1p port based authentication, IGMP snooping, 802.1x, RADIUS authentication support, SNTP, RMON, SNMP, Secure shell, VLAN, Guest VLANs, STP, RSTP, UDP, IGMP, TELNET, TCP/IP, etc.
- Shall be compliant with safety & EM standards like UL 60950, NOM, FCC etc.
- Shall be supplied along with accessories for mounting in standard 19" switch racks
- Shall have console port for switch configuration and management console cable has to be supplied.
- Shall be suitable for operation on 160-240V AC of 50Hz. Suitable power cord of Indian design is to be supplied.
- Shall be on warranty for a period of 3 years from the date of material inspection.
- Shall be supplied along with latest version of software released for that model by the manufacturer. Manufacturer's letter to be submitted with serial no. reference for warranty terms.
- Switches shall comply with 'Restriction of the use of Certain Hazardous Substances' in certain Electrical and Electronic Equipment directive i.e., ROHS compliant.
- The OEM shall be having ISO certification for manufacturing of switches.
- Network switches shall be through a manufacturing process with third party performance verification from neutral certifiers like Tolly group.
- Shall be configured at site based on data provided by VSP as per site requirement

<u>24 port Network Switch:</u>

- Shall be having 24 nos. of auto negotiating 10/100/1000 Mbps RJ45 ports including two nos. of SFP ports.
- Shall be equipped with two nos. of up-linking SFP ports (including GBIC/Mini-GBIC transceivers suitable for 9/125 microns SMF cable) suitable for connecting to the core switch through 9/125 microns SMF cable at a distance of 10 kms.
- Shall be capable of layer 2 functionalities.
- Shall have switching fabric capability of 32 Gbps, packet throughput of 35.7 Mpps.
- Shall have status indicators for all ports.
- Shall have features like QoS with priority queues, Advanced QoS, IP multi-cast, 802.1p port based authentication, 802.1x, RADIUS authentication support, SNTP, RMON, SNMP v3, IPv6, Secure shell v2, VLAN, Guest VLANs, STP, RSTP, UDP, IGMP, TELNET, TCP/IP, etc.
- Shall be compliant with safety & EM standards like UL 60950, NOM, FCC etc.

- Shall be suitable for mounting in standard 19" switch racks
- Shall have console port for switch configuration and management console cable has to be supplied.
- Two nos. fiber patch cords of 3 mtr. length & suitable for up-linking ports are to be supplied along with each switch.
- Shall be suitable for operation on 160-240V AC of 50Hz. Suitable power cord of Indian design is to be supplied.
- Shall be supplied along with latest version of software released for that model by the manufacturer. Manufacturer's letter to be submitted with serial no. reference for warranty terms.
- Shall be on warranty for a period of 3 years from the date of material inspection.
- Shall be configured at site based on data provided by VSP as per site requirement.
- The OEM shall be having ISO certification for manufacturing of switches.
- Network switches shall be through a manufacturing process with third party performance verification from neutral certifiers like Tolly group.
- Switches shall comply with 'Restriction of the use of Certain Hazardous Substances' in certain Electrical and Electronic Equipment directive i.e., ROHS compliant.

<u>25 mm PVC pipe ;</u>

- Shall be of a standard IS approved make.
- PVC Pipe shall be of 25 mm diameter.
- Shall be used for laying indoor OFC, UTP and telephone cables as required.
- Shall include all accessories like clamps, saddles, L Bends, T bends, Pull boxes, screws, plugs etc.
- Wherever false ceiling / flooring is involved, the covers are to be opened and after the conduiting / cabling works, they are to be repositioned / re-fixed properly.

<u>25 mm dia. GI Conduit:</u>

- Shall be of standard IS: 9537 part II or latest approved make.
- Conduit shall be of 25 mm diameter
- Shall be used for laying indoor OFC & UTP cables as required.
- Shall include all accessories like clamps, saddles, L Bends, T bends, Pull boxes, screws, plugs etc.
- Wherever false ceiling / flooring is involved, the covers are to be opened and after the conduiting / cabling works, they are to be repositioned / refixed properly.

<u>25mm dia. Flexible metal cum PVC/PE pipe;</u>

- Shall be of a standard make.
- Conduit inner dia. shall be of 25 mm and suitable for inserting the 25mm pvc pipe at false ceilings, wall entry, etc.,
- Shall have embedded metal construction in the piping.
- Shall be used for laying indoor OFC & UTP cables as required.
- .Wherever false ceiling / flooring is involved, the covers are to be opened and after the conduiting / cabling works, they are to be repositioned /

refixed properly.

Wall Mounted Information Outlet (Cat.6):

- Wall outlet including deep back box of 'Anchor' variety shall be fixed on the wall with the screws at the end of the PVC casing-capping /GI pipe/PVC pipe and UTP cable be laid into the box.
- UTP cable is to be properly cut, sleeve stripped and wires crimped in the RJ 45 modular jacks (with suitable crimping tool) or tool less termination provided behind the face plate as per TIA/EIA 568 A/B standards with sufficient loop cable inside the box.
- Face plate shall have single outlet, Cat.6, 1000 Mbps standards, fully spring -loaded shutter on the RJ 45 jack and suitable for the Cat.6 RJ 45 patch cord being supplied.
- It shall have protected labeling, mounting hardware, provision for fixing it on to the deep back housing, which shall also be supplied.
- Modular jack shall have IDC silver coated/plated type termination suitable for cables with 0.4 to 0.63 mm dia solid or stranded conductors and suitable for Krone, KATT, AT & T, 110 type modules.

GI pipes for road crossing & Building entry:

- Shall be of Medium Gauge and of IS: 1239 standard approved make.
- Shall be of 50 mm diameter for Road Crossings and 40 mm diameter for Building entries.
- Road crossings shall be done by laying 50 mm dia GI pipes across the roads to facilitate cable laying through them.
- GI pipes shall be buried at a depth of 1000 mm from finished road level. The pipes shall be provided with a coupler, if more than one length is involved. Concrete encasing shall be provided for the laid pipe at both ends and at the coupler. The laid pipe shall be plugged with gunny / plastic covers at both ends before / after cable laying through the pipes. 6 mm G.I. wire shall be laid and kept ready for pulling cables through the pipes before they are plugged with gunny/plastic covers. The road which is cut shall be provided with concrete of 150 mm at the top layer and the road surface shall be made good.
- 40 mm dia GI pipes of required length shall be clamped on the wall with proper bend for allowing entry of cables coming out from the trench. Chipping of the floor for laying the GI pipe to the finished floor level to be done .Sealing of the entry/exit of the pipe on the wall with proper sealing compound to be done after laying of the cables.

OFC splice enclosure:

- All fiber cores are to be jointed using Optical Fiber Fusion Splicing machine and shall be properly put in jointing enclosures/housing kits conforming to the standards like ISO/IEC/EN/TEC approval no. TEC/NR/T/OJC-02/01/016. Feb-02 or latest.
- The spliced fiber cores shall be protected in a standard enclosure suitable for direct burial in the ground and placing in cable trays/tunnels etc.,
- All materials, consumables and tools/ special equipments as required for making the fiber splice joints are in the scope of the contract.

- The enclosure shall be airtight, encapsulated, re-enterable splice housing with minimum three (3) cable entries, bonding straps, end caps, tray for keeping fibers with protection sleeves(of 18 cores capacity) with minimum bending radius and accessories.
- Shall provide chemical, mechanical and environmental protection against outside ambience.
- Joints in the cable runs are to be avoided. Accordingly, Cable lengths are to be considered in single lengths only.
- Shall be supplied with accessories like splice trays -3 nos. (6 fibre), ethyl alcohol, clamps, ties, spacers, rubber gasket, cassette holder, worm guide, funnel, pvc tape, heat-shrink tube, Velcro strap, etc.,
- Shall be of TEC or ISO/IEC approved product.

Cat.6 UTP Patch cord:

- Shall be of Cat. 6 UTP cable with 4-pair 23/24 AWG oxygen free copper wire and conforming to standards EIA/TIA 568-B.2, FCC part 68, IEC 60603-7 and support 1000 Mbps speeds.
- Shall be having factory crimped Cat.6 RJ45 modular plugs and thermally fused strain relief moulded boot with anti-snag mechanism fitted into clear poly-carbonate housing. The locking pin shall have protection for avoiding breakage of the same while dressing of the patch cord.
- Shall have Polyolefin separator for pairs, internal cable manager in RJ45 plug.
- Shall be of the 3ft / 1 mtr. and 10ft / 3 mtr and 15ft/5mtr. specified lengths.
- Shall have minimium mating cycles of 750.
- Return loss should be ≥ 23 dB and attenuation maximum of 0.2 dB.

SMF Patch cord:

- Shall be of duplex type or as per requirement at switch end.
- Shall be of 9/125 µm single-mode (OS1), 900 µm tight buffered, 2/3mm dia, surrounded by aramid yarn, factory polished, OFNR/LSZH outer sheath, serialized cable as specified.
- Shall be having SC connectors as required at switch/patch panel side.
- Attenuation shall not exceed 0.35 db for SM-SC connector ends.
- Minimum return loss should be greater than or equivalent to -45 dB.
- Connector durability should not be less than 500 matings(500 matings < 0.2dB max)
- Shall have ferrule material of Zirconia ceramic, housing body of nickel plated Zinc and boot of thermoplastic elastomer.
- The manufacturers' test results are to be furnished along with each patch cord.
- Shall be of 3 meter length.
- Shall be having a standard colour code on the outer sheath.
- Shall be of the type compatible to the pigtails terminated on the fiber patch panel side and the uplink ports on the switch side.

Network tool kit comprising of:

Network Cable analyzer:

A) General:

- Network cable analyzer of Fluke DTX 1800 or equivalent
- Shall be an integrated unit to test copper, Optical fiber using OTDR and power loss test with ease of operation
- Shall perform Cat 6 Auto test in minimum time & start auto test from remote unit
- Maximum bandwidth (MHz) of the Analyzer frequency shall be 900Mhz, shall have the advance industrial standard Accuracy level of IV
- Shall have the Color display, capability to store graphical results data
- Internal memory capacity : minimum of 250 graphical test results, shall have on-board memory of min. 16 MB with Removable memory card(128MB) and interface
- Shall come with AC to DC adapter/charger, rechargeable battery pack with minimum battery life of 10 hours
- Shall have USB, serial port for PC connectivity, head phones provision for talking between main and smart remote, SC type interface for fibre OTDR modules
- Shall come with Cat 6A permanent link adapter and Cat 6 channel adapter
- Shall be able to swap between testing of Fiber and Copper cable without removing adapter
- Shall support plug-in modules for testing multi mode, single mode fibre cables for loss, length and polarity measurements
- Shall be provided with required batteries, user manuals, carry case for all the items
- Shall submit authorization support letter from OEM having an office/branch in India for the offered make with reference to this tender for sales, service, training and warranty terms

B) Copper Cable Test:

- Network cable Analyser shall enable testing and certification of twisted pair cabling for 10 Gigabit Ethernet deployments, either an existing Cat 6 or Augmented Cat 6 cabling system.
- Cable Analyser shall support below mentioned Cable types: TIA Category 3, 4, 5, 5E and 6: 100 Ω, ISO/IEC Class C and D: 100 Ω and 120 Ω, ISO/ IEC Class E, 100W ISO/ IEC Class F, 100 Ω
- Cat 6 A/ Class E Permanent link adapters shall be plug type and life: shielded and unshielded cable, TIA Cat 3, 4, 5, 5e, 6 and 6A and ISO/IEC Class C, D and E permanent link
- Cat 6 /Class E channel adapters shall be plug type and life: shielded and unshielded cable, TIA Cat 3, 4, 5, 5e, 6 and 6A and ISO/IEC Class C, D and E channels
- The Cable Analyser Should support below mentioned Test Standards: TIA Cat.3 and 5e per TIA/EIA-568B, TIA Cat.5 (1000BASE-T) per TIA TSB-95, TIA Cat.6 per TIA/EIA-568B.2-1, TIA Cat.6A per TIA/EIA-568-B.2-10, ISO/IEC 11801 Class C, D, E and F, EN 50173 Class C, D, E and F, ANSI TP-PMD, IEEE 802.3 10BASE-T, 100BASE-TX, 1000BASE-T, IEEE 802.5 (STP cabling, IBM Type 1, 150Ω) Token Ring, 4 Mbps and 16 Mbps
- The Cable Analyser shall support below mentioned Test Parameters: NEXT, NEXT @ Remote, Wire Map, Characteristic Impedance, Length, DC Loop

Resistance, Propagation Delay, Return Loss (RL), RL @ Remote, Delay Skew, Attenuation, Attenuation-to-crosstalk Ratio (ACR), ACR @ Remote, Power Sum ACR, PSACR @ Remote, ELFEXT, ELFEXT @ Remote, Power Sum ELFEXT, PSELFEXT @ Remote, Power Sum NEXT, PSNEXT @ Remote

- The Cable Analyzer shall be able to complete the Autotest for CAT6 cable in less than 9 seconds
- Analyser shall perform diagnostic tests to pinpoint exact point of failure of length, return loss, all-cross-talk variants - with the advance technique of HDDTX and HDTDR tests for Copper Cable
- The Analyser kit shall have the Universal Permanent Link Adaptor with suitable personality Modules to test links with IDC termination

C) Fiber Cable Test:

- Fiber OTDR module shall be plug type and able to be snapped to the Analyser's Main unit
- OTDR shall automatically measure OTDR traces for both 850nm and 1300nm in one test and can toggle between these traces
- Shall have an event dead zone of 3.7 mtr. typical on 850nm & 3.5 mtr. typical on 1300nm and attenuation dead zone of no more than 10 mtr. at 850nm wave length
- OTDR shall measure OTDR traces upto 6km at 850nm and 20km at 1300nm
- OTDR shall automatically measure OTDR traces for both 1310nm and 1510nm in one test and can toggle between these traces
- OTDR shall have an event dead zone of 3.5 mtr. typical on 1310nm & 1550nm and attenuation dead zone of 10 mtr. typical on 1310 nm & 12 mtr. typical on 1550 nm wave length
- OTDR shall measure OTDR traces upto 20km at 1310nm and 1550nm
- OTDR shall automatically determine the test parameter values needed when testing a fiber and automatically determines the end point of the fiber and scales the OTDR trace to fill most of the display screen
- OTDR shall automatically measure the loss at each connection event
- OTDR shall automatically gives a PASS/FAIL result for a test based on the selected set of test limits and automatically places the display cursor at an event and displays the distance to the event, the loss of the event, and whether the event passes or fails the selected set of test limits
- Shall be able to save both the 850 nm and 1300 nm traces for a fiber into the same test record
- It must be possible to transfer test results to a PC via a USB interface

D) Fiber Cable End face Cleaning Tools

- All components in the kit should enable optimal wet and dry cleaning sequence
- Shall have the fiber solvent that should precisely dispensed from pen
- Shall have various swabs to fit different styles of connector ports
- Shall have the rugged carrying case which stores and transports all cleaning tools
- Cleaning Card Contents: Lint-free material 12 cleaning zones
- Cleaning Cube Contents: Material: Lint-free, 125 wipes
- Solvent Pen Contents: Dispenser: Felt-tip, spring-activated valve in aluminium pen body, fiber optic solvent
- Swabs – 2.5mm Contents: Material: 100ppi medical grade polyurethane sealed foam
- Swabs – 1.25mm Contents: Material: Proprietary compressed polyester fiber

E) Reporting Software:

- The Software shall support and run any of the mentioned OS : Windows® 98, NT 4.0 SP6, Win 2000, ME, XP, or VISTA
- The software reports and statistical Data should enable the Copper and Fiber certification and should demonstrate the installation meet the warranty requirements
- Shall have the capability for making customized summary performance

reports
- Shall create graphs and tables that show margins by test standard, operator
, location and other attributes
- Shall have the capability to add the company Logo and the cover sheet on the Report document
- Shall have the capability to report the overview of the installed cabling plant's performance with all test standards in a Graphical format

Network Multimeter:
- Shall be hand-held battery operated LAN tester of Fluke or equivalent with RJ45 LAN & wire map ports
- Shall test length, open, short, split, wire map, crossed & straight through pairs for Cat.5, 5e and Cat.6 UTP cables
- Shall identify 10BASE-T, 100BASE-TX (full or half-duplex), Token Ring, Telco, Cable ID, un-powered PC or hub, Auto-MDIX ports and Auto-Negotiation or strapped port
- Shall identify an active Ethernet port, ping to identify PC NIC response, etc.,
- Shall provide minimum six cable identifiers, wire-map adapter, RJ 45 coupler, carry case, batteries, user manual, software CD, etc.,

Visual Fault locator:
- Portable hand-held visual fault locator with 635/650 nm visible wave length, class II LASER, continuous & flashing modes, 2.5 mm universal adapter, carry case, batteries, user manual of Fluke Visifault or equivalent

Field Programming unit:
- Field programming unit of standard make with following minimum configuration:
- Intel core2 duo 6570 (2.1 GHz. 800 MHz, FSB, 2MB L2 Cache)
- 14” Widescreen LED Backlit HD-Bright View
- 3 GB DDR 2, 800 MHz (upgradable up to 8 GB, 2 DIM slot)
- 320 GB SATA HDD@ 5400rpm/DVD +/-RW/
- Mobile Intel Graphics Media Accelerator X4500 HD graphics
- Integrated wireless Intel 802.11 a/b/g/n draft & Bluetooth v2.0/Ethernet 10/100/1000, Touchpad/Chiclet keyboard/Integrated 2 MP Camera/ 6 cell Li-Ion Batt/Windows 7 Professional OEM pack
- Two button scroll mouse/56 Kbps built-in modem/MS office 2007
- All drivers in media CD’s, AC to DC adapter, Carry case, etc.,

Trench works (new & existing):

a) For new trench, the scope of the work involves excavation of earth to a depth of 1000mm +/- 10% (as per site conditions) and width of 300mm, sand cushioning of 100 mm is to be provided for the cable to be laid in the trench. Protective RCC slab covers of size 750x250x50 mm^3 are to be provided over the sand cushioning, through out the length of the excavated trench. The tenderer shall supply all materials required for preparation of the RCC slabs like cement, sand, blue metal, (1:2:4 ratio) and 6mm steel rods, etc., and RCC slabs shall be manufactured as per VSP

standards. The dug up earth work is to be backfilled and ramming is to be done.

b) For old trench work, i.e. in routes where existing cables were laid, the scope of the work involves excavating the existing trench to a depth of 700/1000mm/existing depth, removal of the existing RCC slabs in the trench, laying of fiber cables, tagging of cables for every 50 mtrs. and placement of the slabs back in their original position and backfilling & ramming of the earth work.

Common : Adequate and suitable GI pipe protection is to be provided wherever the OFC cable is to laid inside RCC slabs on bridges, entry/exit points of buildings, exposed while routing from the cable paths.

Cable chamber:

- At building entry a cable chamber of size 2 mtrs. X 2 mtrs. X 1 mtr. (L X B X D) is to be built with brick wall. The existing and new cables are to be securely coiled, tagged and kept in a circular fashion in the chamber. Sand is to be filled upto a level of 150 mm over the cable coils and RCC protective slabs are to be provided covering the entire chamber. Back filling of earth is to be done upto ground level.

Cable Route / OFC Joint Marker:

- The cable route markers shall be of RCC block with a base of 300 mm and mile-stone shape top indicator of 100 mm thick (inverted U), 300mm width and 700 mm height (350 mm below and 350 mm above road surface level) from the base.
- The route marker shall be engraved with 'OFC', 'I' and 'VSP' symbols.
- Route markers are to be placed at 50 meters spacing along the cable trench route, both ends of road crossing pipes and at splicing joints if any.
- Route markers shall be painted with yellow colour base and engraved letters with red colour for identification.
- Shall be fabricated as per the enclosed drawing no: VSP/Telecom/OFC-RM: 001.

Electrical Power cable (3 core):

- Shall be 3 Core x 1.5 sq.mm size, standard colour code and confirm to IS: 1554 part-1 of 1988 approved make. Shall confirm to:
- Voltage grade- 1100 V
- Insulation- PVC type-A
- Core laying-up – All cores laid-up together
- Core identification- colour coded
- Outer Sheathing- PVC sheathing
- Conductor material- Annealed bare copper
- Type of strands- multi strand
- Size of cable- 3 core X 1.5 sq.mm
- Standard for conductor- Class-5 to IS-8130/83
- Standard for outer sheath- IS 554 part-1/88
- The cores shall be of multi stranded construction and with individual sheathing for each of the cores and with overall sheathing.
- Shall be used for powering the switch racks/ switch racks from existing

power sources of VSP.
- Shall be laid in PVC/GI conduits as per site requirements.
- Sample approval/clearance to be obtained before actual supply to site.

Power Socket (Electrical) with gang box:
- Shall be of a standard IS approved make.
- Shall be a 3/5-pin 5/15A universal socket mounted on a metallic gang box.
- Installation accessories like screws are to be supplied.
- Shall be installed by grouting onto wall.
- Sample clearance to be obtained before actual supply to site.

In-Line drilling/excavation of BT/RCC roads by mechanical method:
- Excavation underneath existing BT/RCC roads at a depth of 1000 mm for the purpose of cabling below the road surface, without affecting/cutting the road surface or traffic.
- GI pipe/s is/are to be inserted after the job to lay OFC/other cables. The drilling hole size shall be suitable for insertion of pipes up to 100mm dia GI pipes.
- The machinery used shall be of either mechanical/pneumatic/hydraulic type so as to execute inline drilling of the soft/hard/rocky soils beneath the road etc.,
- Proper care is to be taken to avoid damages to existing cables/pipes etc., which may foul across the drilling path.

Project and Product Documentation:
- Switch wise single line schematic diagram (up to wall outlets), logical network diagram of the network, As-built drawings, cable schedules, test results and other installation/ maintenance related data are to be handed over in Three sets (hard copies) and Three sets on CD medium.
- The formats furnished by VSP are to be followed for the project and product documentation.

Integration, testing & commissioning including training:
- Integration of the network in this project is to be done with the existing Gigabit Ethernet LAN of VSP and the integrated performance is to be demonstrated.
- Shutdowns are to be obtained after due clearances from IT / User departments and the slots allowed are to be complied with strictly.
- A) Two days training for four persons on network tools (Network cable analyzer, network multimeter, visual fault locator, etc.,) fundamentals, operation, trouble shooting, configuration, do's and don't's at OEM's or his authorized trainers' place or at VSP onsite.
- B) Two days structured Training on all the items being supplied in the subject tender at VSP premises along with course material for 20 persons.

OEM certification :
- The entire cable (OFC & UTP) network has to be documented, tested with minimum of level 3 testers in accordance with structured cabling standards and cable plant is to be certified by the OEM.

Annexure-

EXPANSION OFDATACOM NETWORK (PHASE-4) FOR VSPBOQ
Estimate (Supply & Installation)

BOQ SNo	Description	Unit	Qty	Supply Price FOR site inclusive of all taxes and duties		Installation, testing and commissioning inclusive of all taxes and duties including service tax	
				Unit Price(Rs)	Total Price(Rs)	Unit Price(Rs)	Total Price(Rs)
(i)	(ii)	(iii)	(iv)	(v)	(vi)	(vii)	(viii)
1	12corearmouredSMFCable	Mtr	10000				
2	6corearmouredSMFCable	Mtr	30000				
3	Cat.6 UTP cable	Mtr	3050				
4	4 port Network Switch	No.	45				
5	Fiber patch panel	No.	70				
6	Cat.6 UTP patch panel	No.	20				
7	42U Switch rack with accessories	No.	4				
8	12U Switch Rack with accessories	No.	30				
9	SMF Pig tail	No.	800				
10	8 port Network Switch	No.	25				
11	24 port Network switch	No.	10				
12	25 mm PVC pipe	Mtr	1000				
13	25 mm dia GI conduit	Mtr	300				
14	25 mm Flexible metal cum PVC/PE pipe	Mtr	100				
15	Wall mounted Information outlet (Cat.6)	No.	100				
16	50 mm GI pipe for road crossing	Mtr	600				
17	40 mm GI pipe for building entry	Mtr	300				
18	OFC splice enclosure	No.	10				

(i)	(ii)	(iii)	(iv)	(v)	(vi)	(vii)	(viii)
19a	UTP Patch cord 3ft/1 mtr	No.	100				
19b	UTP Patch cord 10ft/3 mtr	No.	100				

19c	UTP Patch cord 15ft/ 5 mtr	No.	100				
20	SMF patch cord	No.	100				
21a	Network Cable Analyser	Set	1				
21b	Network multimeter	Set	4				
21c	Visual Fault locator	No.	4				
21d	Field programming unit	No.	2				
22a	Trench work-New	Mtr	8000				
22b	Trench work-existing	Mtr	3500				
23	Cable chamber	No.	20				
24	Cable route/ OFC joint marker(Fab. & Inst)	No.	400				
25	3 X 1.5 sq.mm electrical power cable	Mtr	450				
26	Power socket with gang box	No.	50				
27	In-line drilling/Excavation of BT/RCC roads	Mtr	400				
28	Project and product documentation	lot	1				
29	Integration, testing and commissioning including training	lot	1				
30	OEM certification	lot	1				
	Total value (Rs.)						

QUOTE SHEET

Name of the work : : Expansion of Datacom Network (Phase-4) for VSP.

Sl. No.	Description of the Work	Estimated Amount (in Rs.)	Quoted Amount In Figures (in Rs.)	Quoted Amount in Words (in Rs.)
1.	Supply FOR site inclusive of all taxes & duties (as per Annexure-2)			
2.	Erection, testing & commissioning including all taxes & duties and Service Tax (as per Annexure-2)			

Description	Quoted Value in Figures (in Rs.)	Quoted Value in words (in Rs.)
Amount of Cenvatable Excise Duty included in 80% of BOQ Quantities at Sl.No: 1 above.		
Amount of Service Tax included in Sl.No: 2 above.		
Amount of Input Tax Credit (ITC) on account of APVAT included in Sl.No: 1 above.		
Amount of Input Tax Credit (ITC) on account of APVAT included in Sl.No: 2 above.		

Signature of the Tenderer